been able to secure much valuable testimony of this sort on the subject.

A great deal, however, can be ascertained by careful trials, such as those which have been undertaken on two occasions at Liverpool (1898 and 1899), since measurements and data can be obtained with a staff of observers for a limited period, which could scarcely be secured in continuous working. The results of these trials are given in tables and also statements by the Chief Mechanical Engineer of the Lancashire and Yorkshire Railway, on the working of a Thornycroft motor wagon; the Engineer-in-Chief, Mersey Docks and Harbour Board; and the City Engineer of Liverpool, on the working of Leyland motor wagons; and by Mr. Bryan Donkin, on the tests of motor carriages at Richmond and Birmingham.

Looking at the whole question, it may be safely said that the motor vehicle has come to stay, and that its uses, both in peace and war, will rapidly and enormously develop. The public interest which is now seen partly by the immense number of patents taken out in connection with the industry, partly by the great growth of literature on the subject, and by the formation of automotor clubs, is not a mere transient thing, and although the motor vehicle is at present still somewhat of a *rara avis* upon our roads, it may not be going too far to think that the coming century will see a development of locomotion upon roads comparable with the development of locomotion of the railway in the century which, according to our individual views of chronology, is either past or so very nearly past.

THE UNIVERSITY OF BIRMINGHAM.

THE present position of the scheme for the establishment of a Midland University was explained by Mr. Chamberlain, Chancellor of the new University, at the first meeting of the Court of Governors, held on Thursday last. In the course of his remarks, Mr. Chamberlain is reported by the *Times* to have said that it was desired to create a great teaching University, in which all who came to them for it should find efficient and complete instruction in every branch of knowledge. Again, they desired that their University should be a school of research. They were firmly convinced that that was necessary if it was to maintain its dignity and great position. They believed that those were the best teachers who were themselves constantly learning, and that without adding continuously to the common stock of knowledge they would not be fulfilling their duties. In order to secure those objects they ventured to ask for a further endowment of a quarter of a million sterling. To-day they were able to announce that they had already received promises of 330,000*l.*, the amount having been largely increased by the munificent donations of Mr. Carnegie, of an anonymous benefactor, of Mr. Charles Solcroft, and of Mr. George Kenrick.

They intended that their University should be a distinctive University. In what he had hitherto indicated there was nothing original, nothing in which they were likely to specially differentiate themselves from the other great Universities, especially from the modern Universities in this country and the older Universities of Scotland; but they hoped that their University would take some colour from its environment, that not only would it be a school of general culture, but that it would also practically assist the prosperity and welfare of the district in which it was situated by the exceptional attention which it would give to the teaching of science in connection with its application to local industries and manufactures; and this portion of their task had turned out to be much greater, much more responsible, than they anticipated. They were encouraged in undertaking it by the gift of Mr. Carnegie, which was specially to be devoted to the creation of a college of science, following somewhat the example which had been set by the great colleges in the United States of America; and Mr. Carnegie followed this up by a proposal that a deputation from the intended University should visit the chief seats of learning across the water.

Those who had read the report of the committee that had visited Canada and the United States would begin to understand how it was that we were behindhand in the preparation for that great struggle which must come, that commercial competition between nations in which the weakest would inevitably go to the wall. For what did they find established both in the United States and in our own colony of Canada? They found great institutions connected with a general University, with colleges of science occupying large spaces, in which the area was counted by many acres, fully equipped with proper buildings, with the most modern and complete machinery, with the latest scientific appliances, with laboratories for every conceivable scientific purpose; and in those great colleges a training was given such as they desired to see imitated in this country—a training based, as all education ought to be, upon a foundation of general culture, but specialised in its course, highly specialised according to particular and separate work which each student intended to undertake in life. As a result of this they began to see how it was that in America the great commercial and industrial undertakings, the manufacturers and inventors, found no difficulty whatever in obtaining the services of as many young men as they might require to manage and complete and develop their undertakings, all of them ready when they left college, not merely to deal with the ordinary routine and management of a business, but to bring to it the latest discoveries and to apply the highest science to its development. That was what they wanted in Birmingham, and they would not have the University which they all had in their minds until they had accomplished it.

All that was wanted was money. The committee had pointed out that to carry out this scheme with any completeness a further sum, partly for endowment, partly for buildings and machinery and appliances, of 155,000*l.* was required. He was quite convinced, even from an incomplete examination of the project, that they had under-estimated the cost. He thought himself that another quarter of a million was the smallest sum which they would require in order to put this portion of their undertaking upon a thoroughly satisfactory basis. Well, they must get it, and he anticipated that they would obtain it. He anticipated that they would obtain it from two sources. No thing he thought was more striking to any one who had studied educational progress in America and in our great colonies than the readiness, the eagerness, with which men who had acquired great wealth had been willing to devote a considerable portion of it in sums to which we here, he was sorry to say, were almost unaccustomed, to the promotion of the higher education. It was the case in Canada, in the great Universities of Montreal and Toronto; it was the case in America, in Cornell, in the Stamford University, in the Chicago University, in the Columbia University; and it was also visible in the great donations which had been made to the older Universities of Harvard and of Yale. He could not doubt that the feeling that no better application than this could be found for wealth would grow among them about Birmingham, and that although they lived in a district which had hitherto not been remarkable for exceptional fortunes, yet which did contain many men of great wealth. They also would find a tendency, from which the University would derive advantage in the future, to make their contributions towards such purposes as he had described. He hoped that this might be the case, and he thought he might say that he had confidence that it would be the case, and they might expect before long that their funds would be largely increased from some such source.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Mr. Chawner, Master of Emmanuel College, has been re-elected Vice-Chancellor.

Mr. Frederick Harrison will deliver the Rede Lecture in the Senate House on June 12, at noon. The honorary degrees referred to last week will be conferred on the same day, at 3 p.m.

The Knightbridge Professorship is vacant by the resignation of Dr. Sidgwick, who has been seriously ill.

Mr. L. R. Wilberforce, of Trinity College, has been elected a University Lecturer in Experimental Physics in the place of Mr. W. N. Shaw.

A grant of 50*l.* from the Balfour Fund has been made to Mr. J. S. Budgett in aid of his researches on the development of Polypterus.

Dr. Allbutt and Dr. Collingridge have been appointed delegates to represent the University at the International Congress of Hygiene and Demography to be held at Paris next August.

THE 500th anniversary of the foundation of the University of Cracow will be celebrated to-day, June 7. Representatives will be present from most of the European universities.

MR. W. T. A. EMTAGE, principal of the Wandsworth Technical Institute, has been appointed Director of Public Instruction in Mauritius. The post has been newly created, and Mr. Emtage will have the oversight of all the educational work under Government in the Colony. His first task will be the organisation of a system of technical education.

AT University College, London, Andrews Entrance Scholarships of 30*l.* each have been awarded to Mr. L. Graham, of Mason College, Birmingham, and to Mr. C. E. K. Mees, of St. Dunstan's College, Catford. The Atchison Scholarship of 55*l.* per annum for two years has been awarded to Mr. R. E. Lloyd for the greatest proficiency as a student of the medical faculty and the hospital during the past two years. The Bruce medal has also been awarded to Mr. R. E. Lloyd for proficiency in pathology and surgery.

THE Senate of the University of London has resolved that one sum of 100*l.* be offered as the Rogers Prize open for competition to all the members of the medical profession in Great Britain and Ireland, for an essay upon the production of immunity in specific infective diseases generally; and with particular reference to any one disease on which the writer of the essay has made original investigations. The essay is to be sent to the Registrar, University of London, South Kensington, S.W., on or before June 1, 1901.

THE Yorkshire College, Leeds, is now one of the university centres that grant a degree to students of agriculture. At a meeting of the Court of Victoria University (on May 3) a report of the Council recommending the inclusion of agriculture as a subject for the B.Sc. degree was adopted. Among other requirements, the scheme provides that students before taking their degree must conduct at an experimental farm controlled by a College of the University an experiment on some agricultural subject, and submit a report of the same. Only those students who, before entering the University, have attended an agricultural school for two years will be exempted from this rule.

AN illustrated prospectus of the courses of chemistry and chemical engineering at the Massachusetts Institute of Technology has recently been received. The prospectus includes descriptions of the various chemical laboratories, and the accompanying illustration of the main laboratory of industrial chemistry is of interest as indicating the provision made, in one of the foremost technical institutions in the United States, for work by students taking a general course in chemical industries. The ordinary course in chemistry in the Institute extends over a period of four years, and embraces almost all branches of chemical science. The aim throughout the whole course of instruction is not only to impart the necessary professional knowledge, but also to teach the student self-reliance, to accustom him to habits of accurate thought and work, and to instuct him in the methods of investigation of new problems. The course is designed primarily to prepare students for actual work in connection with manufactures based on chemical principles, but it provides also for those who expect to become teachers of chemistry, and for those who intend to devote themselves to scientific research. The object of the instruction in industrial chemistry is to set before the students as fully as possible the present status of the chemical industries. The laboratory instruction includes the preparation of pure chemicals, and the refinement or purification of technical products, by industrial processes. Among the processes carried out in the laboratory are the manufacture of dyers' mordants, soaps, phosphates from bone ash, and soda crystals; and also the preparation of salts of ammonium, barium, calcium, iron, copper, tin, chromium, &c., from minerals or other crude material. In addition, about eighty lectures are given on the most important industrial processes, and excursions are frequently made to manufacturing establishments.

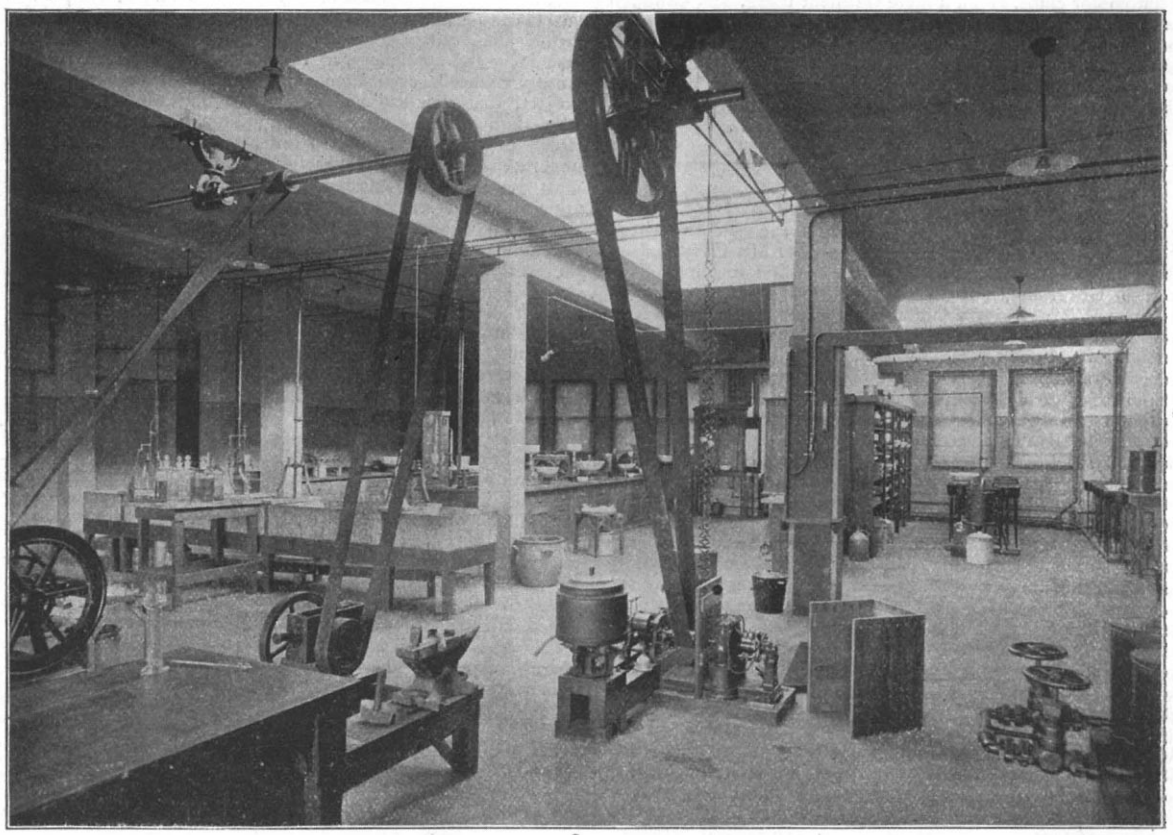

FIG. 1.—Laboratory of Industrial Chemistry of the Massachusetts Institute of Technology.